

Rejections under 35 U.S.C. § 102

A. Hix

Claims 1, 2, 3, 4, 22, and 30 were rejected as being anticipated by U.S. Patent No. 3,835,653, issued to Hix, Jr. ("Hix"). To the extent this rejection applies to the amended claims, it is respectfully traversed.

Hix discloses an underwater storage device having a cylindrical tank with a top closure and an open bottom. In one embodiment, the tank is attached to the sea bottom by cables (26). According to Hix, one end of the cables (26) is attached to the tank while the other end is attached to an anchor (28) embedded in the water bed. In this anchored embodiment, an oil inlet connection (24) is positioned along the midpoint of a wall (Fig. 2) and an oil outlet connection (18) is located at the top of a top portion (16). According to Hix, seawater entry and egress occurs through the open bottom (Col. 2, lines 31-33). The second embodiment disclosed by Hix also has an open bottom (Col. 2, lines 59-61) and is not anchored to the sea floor, being instead held in place by gravity (Col. 2, lines 47-49). The wall of the device is formed of a pair of cylindrical sheets (32a, 32b) that together form a concrete mold (Col. 2, lines 53-55). This device includes an oil inlet connection (42) and a water inlet (44).

Amended claim 1 of the instant application recites a system comprising a storage tank attachable to a seabed, at least one fluid channel having a first end inside of the tank, near the bottom of the tank and a second end in fluid communication with seawater outside of the tank, at least one offload line having a first end in fluid communication with the tank and a second end adapted to be fluid coupled to a tanker, and at least one hawser having a first end operatively coupled to the tank at a location below the water surface and a second end that is accessible from the water surface and attachable to the tanker. Claims 2, 3, 4, and 22 depend from claim 1 and thus include each of these limitations. Claim 30 also recites a system comprising a storage tank attachable to a seabed and at least one offload line and at least one hawser, similar to the offload line and hawser of claim 1. Embodiments of the invention in accordance with these claims may advantageously provide storage for offshore production so that quantities of hydrocarbons can be continually produced during adverse weather conditions independent of the availability of a tanker. In some embodiments, the present invention may be used to eliminate the need for costly deepwater pipelines. Furthermore, embodiments of the present invention may advantageously

provide a system for maintaining the position of a tanker during offtake without placing mooring stress on a hose of the offload line, which could result in damage to the hose and release of hydrocarbons into the marine environment.

As stated by the Examiner in Section 6 of the Office Action, Hix fails to disclose or suggest at least a hawser. Furthermore, Hix fails to disclose or suggest the use of the storage system in conjunction with a tanker. More importantly, Hix does not teach or suggest a hawser having a first end operatively coupled to the tank at a location below the water surface and a second end accessible from the water surface and attachable to the tanker. Instead, the cables (26) according to Hix are connected to a plurality of anchors (28) embedded in the sea bed or to dead weight anchors or piles driven in the ocean floor (col. 2, lines 12-16). These cables (26), having a second end embedded in the ocean floor, do not have a second end adapted to be accessible from the water surface and furthermore, are not attachable to a tanker as recited in claims 1 and 30. Accordingly, withdrawal of this rejection is respectfully requested.

As stated in *Verdegaal Bros., Inc. v. Union Oil Co. of California*, 814 F.2d 628 (Fed. Cir. 1987), a claim is anticipated only if *each and every element* as set forth in claim is found, either expressly or inherently described, in a single prior art reference. As the Examiner noted in Section 6 of the Office Action, Hix does not disclose a hawser. Therefore, Hix can neither disclose nor suggest that a hawser has a first end operatively coupled to a tank at a location below the water surface, as recited in the amended claims. This requirement for anticipation is also reiterated in *Rockwell Intern. Corp. v. U.S.*, 147 F.3d 1358 (Fed. Cir. 1998).

In the event that the Examiner wishes to maintain this rejection, Applicants respectfully request an affidavit under 37 C.F.R. §1.104(d)(2), setting forth the basis and/or technical reasoning to support the assertion that the cables (26), having a second end embedded in the ocean floor would anticipate an end of a hawser adapted to be accessible from the water surface and attachable to a tanker.

In view of the above, Hix fails to disclose or suggest at least the hawser, as recited in claims 1 and 30. For at least these reasons, claims 1, 2, 3, 4, 22, and 30 are patentable over Hix. Accordingly, withdrawal of this rejection is respectfully requested.

B. Manning

Claim 30 was rejected as being anticipated by U.S. Patent No. 3,479,673, issued to Manning. To the extent this rejection applies to the amended claim, it is respectfully traversed.

Manning discloses an apparatus for the mooring and loading of vessels. The apparatus includes a surface unit, means for anchoring the surface unit, and a submerged storage facility having an open bottom, with at least one fluid passage between the storage facility and the surface unit. A tether pipe (10) provides a fluid passage (Col. 5, lines 2-4) between the storage tank (12) and the floating terminal (13). Fluid is directed from a pipeline (102) directly to the floating terminal (13) through the tether pipe (10). Once at the floating terminal (13) the fluid is processed and pumped down into the storage tank (12). In order to extract oil from the storage tank (12) a valve (116) must be manipulated to route the oil from the tether pipe (10) through a leg (32) of the tether arm (22), the float (40) and the leg (60) of the boom (56) (col. 5, lines 52-64). A mooring line (68) of a tanker (67) is looped over a bollard (66) on a flotation tank (64), to moor the tanker (67) to the floating terminal (13).

Claim 30 recites a storage tank attachable to a seabed and having at least one offload line and at least one hawser. The at least one offload line has a first end coupled to and in fluid communication with the tank proximal a top of the tank, and a second end adapted to be fluid coupled to a tanker. The at least one hawser has a first end operatively coupled to the tank at a location below the water surface and a second end adapted to be accessible from the water surface and attachable to the tanker.

In contrast, the mooring line (68) of Manning is disclosed as attached to the tanker (67) at a first end and is attachable to a bollard (66) at the second end. Neither end of the mooring line is operatively coupled to the tank (12) at a location below the water surface, as recited in amended claim 30. In fact, for the apparatus and method according to Manning to remain operable in the manner intended (having a boom (56) that is capable of being raised and lowered in order to form a fluid passage and provide a mooring structure), the boom must remain above the surface. Therefore, Manning fails to teach or render obvious hawser having a first end operatively coupled to a tank at a location below the water surface, as recited in amended claim 30. Furthermore, the loading and mooring means according to Manning is also designed to pivot around the terminal (Col. 1, lines 59-62). Manning also states that the mooring system will have

a deck upon which may be disposed electrical generators and power sources (Col. 7, lines 22-27). Thus, in order for a hawser according to Manning to operatively connect at a location below the water surface, the boom and mooring system according to Manning would be rendered inoperative in the manner intended. For at least these reasons, claim 30 is patentable over Manning. Accordingly, withdrawal of this rejection is respectfully requested.

Rejections under 35 U.S.C. § 103

A. Manning in view of Hix

Claims 1-12, 17-22, and 24-26 were rejected as being obvious over Manning in view of Hix. To the extent this rejection applies to the amended claims, it is respectfully traversed.

Amended claim 1 of the instant application recites a system comprising a storage tank attachable to a seabed, at least one fluid channel having a first end inside of the tank, near the bottom of the tank and a second end in fluid communication with seawater outside of the tank, at least one offload line having a first end in fluid communication with the tank and a second end adapted to be fluid coupled to a tanker, and at least one hawser having a first end operatively coupled to the tank at a location below the water surface and a second end that is accessible from the water surface and attachable to the tanker. Claims 2-12, 17-22, and 24-26 depend from claim 1 and thus include each of these limitations. Embodiments of the invention in accordance with these claims may advantageously provide storage for offshore production so that quantities of hydrocarbons can be continually produced during adverse weather conditions independent of the availability of a tanker. In some embodiments, the present invention may be used to eliminate the need for costly deepwater pipelines. Furthermore, embodiments of the present invention may advantageously provide a system for maintaining the position of a tanker during offtake without placing mooring stress on a hose of the offload line, which could result in damage to the hose and release of hydrocarbons into the marine environment.

As discussed in detail above, Hix fails to show or suggest at least the hawser, as recited in amended claim 1. While Manning shows a ship having a hawser attached to a boom system, Manning fails to show or suggest at least a hawser operatively coupled at a location below the water surface, as recited in amended claim 1. Therefore, Manning and Hix, whether considered singly or combined, fail to disclose or render obvious the invention as recited in

amended claim 1. Accordingly, amended claim 1 is patentable over Manning in view of Hix. Claims 2-12, 17-22, and 24-26, which depend from amended claim 1, are likewise patentable for at least the same reasons. Accordingly, withdrawal of this rejection is respectfully requested.

B. Manning in view of Hix and further in view of Braud

Claims 13-16 were rejected as being obvious over Manning and Dix (Applicants believe the intended reference is “Hix”, and proceeds accordingly) and further in view of U.S. Patent No. 5,816,183, issued to Braud, et al. (“Braud”). To the extent this rejection applies to the amended claims, it is respectfully traversed.

These claims, through their dependency on amended claim 1, include all of the elements of claim 1 as discussed above and further include a subsurface buoyant device (“SBD”) located at a predetermined depth. The positioning of a SBD at such a depth advantageously provides protection to the SBD and tensioned riser from surface effects of storms and other disturbances. Such protection ensures that the offtake system will not be damaged and facilitates the use of the offtake system during such disturbances.

As previously discussed, Manning and Hix, alone or in combination, fail to disclose or suggest a hawser having a first end operatively coupled to the tank at a location below the water surface and a second end that is accessible at the surface and attachable to the tanker, as recited in claim 1. Hix, as noted by the Examiner, fails to disclose a hawser. Furthermore, any hawser according to Manning, can not be operatively connected to the tank at a location beneath the water surface without rendering the boom and mooring system of Manning inoperative in the manner intended. Further, Manning teaches a processing terminal between the tank and the tanker. Therefore, Manning neither discloses nor suggests a hawser as recited in claim 1.

Braud fails to overcome the deficiencies noted in Manning and Hix. Rather, Braud teaches a submerged mooring buoy that is anchored to a seabed and provides a mooring for floating units. The mooring buoy may also include a pipe structure that extends down to the seabed to connect to a well, and also includes a hose for connecting the pipe structure to a floating unit, such as a tanker. Lacking any type of storage structure, Braud neither discloses nor suggests a storage and offload system according to the instant claims. Because Braud’s buoy connects directly to a well, Braud also fails to disclose or suggest a hawser coupled to a tank as

recited in claim 1. Furthermore, the Examiner has provided no line of reasoning and the Applicants are aware of none, that would motivate one of ordinary skill to “pick and choose” the claimed features out of the cited references to achieve the Applicants’ claimed invention.

In summary, none of the cited references disclose or suggest a hawser having a first end operatively coupled to the tank at a location below the water surface and a second end that is accessible at the surface and attachable to the tanker, as required in these claims. For at least this reason, claims 13-16 are patentably distinct over these three references. Accordingly, withdrawal of this rejection is respectfully requested.

C. Manning in view of Hix and further in view of Phelps

Claim 23 was rejected as being obvious over Manning and Dix (Applicants believe the intended reference is “Hix”, and proceeds accordingly) and further in view of U.S. Patent No. 3,645,415, issued to Phelps. To the extent this rejection applies to the amended claim, it is respectfully traversed.

This claim, through its dependency on amended claim 1, includes all of the elements of claim 1 as discussed above and further recites that the storage tank is a pressure balanced vessel having a box-shape and a web-framed steel structure. Furthermore, this claim, as amended, includes the limitation that the tank include stable flotation for open-water tow. A pressure balanced tank advantageously permits the use of a relatively thin-walled structure, such as a web-framed steel vessel.

As previously discussed, Manning and Hix, alone or in combination, fail to disclose or suggest a hawser having a first end operatively coupled to the tank at a location below the water surface and a second end that is accessible at the surface and attachable to the tanker, as recited in claim 1.

Phelps fails to overcome the deficiencies noted in Manning and Hix. Rather, Phelps discloses a tank having an outer wall comprising cylindrical elements and webs joined to junctures of these cylindrical segments. Phelps is completely silent with respect to a hawser configuration as recited in claim 1. Phelps also fails to disclose or suggest that the tank have stable flotation for open water tow, as recited in the amended claim 23. Furthermore, the Examiner has provided no line of reasoning and the Applicants are aware of none, that would

motivate one of ordinary skill to “pick and choose” the claimed features out of the cited references to achieve the Applicants’ claimed invention.

In summary, Manning, Hix and Phelps, whether considered separately or in combination, fail to disclose or suggest a hawser having a first end operatively coupled to the tank at a location below the water surface and a second end that is accessible at the surface and attachable to the tanker, as required in these claims. For at least this reason, claim 23 is patentably distinct over these three references. Accordingly, withdrawal of this rejection is respectfully requested.

D. Hix in view of Anderson

Claims 27-29 were rejected as being obvious over Hix in view of U.S. Patent No. 4,273,066, issued to Anderson. This rejection is respectfully traversed.

Claim 27 of the instant application recites a system comprising a storage tank attachable to a seabed, at least one fluid channel having a first end inside of the tank, near the bottom of the tank and a second end in fluid communication with seawater outside of the tank. A tensioned riser is in communication at a first end with the tank proximal the top and connected proximal a second end to a subsurface buoy positioned at a desired depth, and a flexible hose that at a first end is coupled to and in fluid communication with the riser and at a second end is coupled to a surface buoy, accessible from the water surface, and adapted to fluid couple to a tanker. At least one hawser is shorter than the hose and is coupled at a first end to the riser and at a second end to the surface buoy, so that the hawser may attach to a tanker. A coupling device is provided between the second end of the riser and the first end of each of the hawser and hose, and weighted material is disposed in the tank. Claims 28-29 depend from claim 27 and include each of these limitations. Embodiments of the invention in accordance with these claims may advantageously provide storage for offshore production so that quantities of hydrocarbons can be continually produced during adverse weather conditions independent of the availability of a tanker. In some embodiments, the present invention may be used to eliminate the need for costly deepwater pipelines. Furthermore, embodiments in accordance with these claims may advantageously provide a system for maintaining the position of a tanker during offtake without placing undue stress on the offload hose, which could result in damage to the offload line or

storage tank and release of hydrocarbon into the marine environment. This is achieved by providing a hawser with a shorter length than that of the hose, so that mooring stresses are borne by the hawser (paragraph 41 of the specification) and not the hose. Finally, the use of a surface buoy advantageously provides for easy access to the hawser and offload line.

As previously discussed, Hix fails to disclose or suggest a hawser, as recited in these claims. Anderson fails to overcome the deficiencies noted in Hix. Rather, Anderson discloses a method of delivering oil from an offshore well to a storage tanker disposed on the water surface, including a mooring system having a buoyant riser tube (32) and an oil line (36) extending from a submarine well or production facility and running along or inside the riser tube (32). A mooring chain (42) extends from a spacer buoy atop the riser tube (32) and is attachable to a vessel. The chain can be attached to a windlass (see Fig. 3C) to adjust the tension in the chain. Because the chain is windlassed and stowed, it must necessarily have a greater length than the oil hose (44). This fact is readily apparent in Fig. 3C and Fig. 7A. Although a shorter hawser is depicted in Fig. 4 of Anderson, this is for the surface embodiment and does not disclose or suggest that the hawser would operatively connect to a tank at a location beneath the water surface, as described at Col. 14, lines 20-40. Because the instant claims require that the hawser be operatively connected to a tank at a location beneath the water surface, Anderson would not function as intended in such a configuration. Therefore, Anderson neither discloses nor suggests the hawser of the instant claims, which is shorter than the hose and operatively coupled to the tank at a location below the water surface. Furthermore, Anderson also fails to disclose or suggest a surface buoy, according to these claims.

In view of the above, Anderson and Hix fail to disclose or suggest at least the shorter hawser, and the surface buoy, as recited in claim 27. For at least these reasons, claims 27-29 are patentable over these two prior art references. Accordingly, withdrawal of this rejection is respectfully requested.

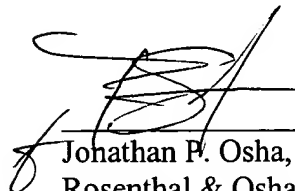
Conclusion

Claims 1-30 have been shown to be allowable over the prior art. Applicants believe that this paper is responsive to each and every ground of rejection cited by the Examiner in the Action dated October 10, 2002, and respectfully requests favorable action in the form of a Notice

of Allowance. Please apply any charges not covered, or any credits, to Deposit Account 50-0591
(Reference Number 06558.011001).

Respectfully submitted,

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Marked up Version of the Claims

1. (Amended) An oil storage and offtake system, comprising:
a storage tank attachable to a seabed and adapted to store hydrocarbons therein;
at least one fluid channel having a first end positioned inside of the tank proximal
a bottom of the tank and a second end in fluid communication with
seawater outside of the tank;
at least one offload line having a first end coupled to and in fluid communication
with the tank proximal a top of the tank and a second end adapted to be
fluid coupled to a tanker and accessible from a water surface; and
at least one hawser having a first end operatively coupled to the tank at a location
below the water surface and a second end adapted to be accessible from the
water surface and attachable to the tanker to anchor the tanker during
offtake operations.
23. (Twice Amended) The system of claim 1, wherein the storage tank is a pressure
balanced vessel having a box-shaped configuration with a web-framed steel
structure and stable flotation for open-water tow.
30. (Amended) An oil storage and offtake system, comprising:
a storage tank attachable to a seabed and adapted to store hydrocarbons therein;
at least one offload line having a first end coupled to and in fluid communication
with the tank proximal a top of the tank and a second end adapted to be
fluid coupled to a tanker and accessible from a water surface; and
at least one hawser having a first end operatively coupled to the tank at a location
below the water surface and a second end adapted to be accessible from the
water surface and attachable to the tanker to anchor the tanker during
offtake operations.